

MIL-T-15071B(SHIPS)
16 August 1954
SUPERSEDING
MIL-B-15071A(SHIPS)
20 October 1952

MILITARY SPECIFICATION
TECHNICAL MANUALS FOR MECHANICAL
AND ELECTRICAL EQUIPMENT

1. SCOPE

1.1 Scope. - This specification covers technical manual requirements for electrical and mechanical equipment.

1.2 Classification. - Technical manuals shall be of the following types as specified (see 6.1):

Type A - (Type A manuals may be required where the system or equipment to be described is of a highly specialized or extremely complex nature, and where the importance of the equipment justifies unusual effort in the preparation of the manual.) (See 3.3.)

Type B - (Type B manuals are required where the equipment or system to be described has no direct commercial counterpart or which is sufficiently complex that a detailed description, and maintenance instructions are required and must be supplemented by sufficient photographs, drawings, parts lists, etc.) (See 3.5.)

Type C - (Type C manuals are required where the equipment or system to be described is an adaptation or variation of conventional commercial equipment, where with certain modifications and additional data, the type of instructional matter normally furnished will serve the purpose.) (See 3.6.)

Type D - (Type D manuals are required where the equipment or system to be described is generally the same as equivalent commercial equipment, or is sufficiently simple that standard manufacturer's instruction pamphlets and service data are adequate.) (See 3.7.)

2. APPLICABLE DOCUMENTS

2.1 The following specifications and drawings, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

MILITARY

MIL-R-15137 - Repair Parts for Electrical and Mechanical Equipment (Naval Shipboard Use).

NAVY DEPARTMENT

General Specifications for Inspection of Material.

H
GPO-O-NAV-M-99

MIL-T-15071B(SHIPS)

DRAWINGS

BUREAU OF SHIPS

S0103-73729 - Standard Drawing Format for Production Drawings Prepared by
Contractor or Manufacturer for Approval by Government Agency.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Material. - The minimum material requirements are as specified hereinafter. A good grade material shall be used when a definite material is not specified.

3.2 Distribution required. - Distribution shall be as follows except when identical manuals have been previously distributed to all the addressees:

- (a) Two copies packed with each unit of equipment (for ultimate placement onboard ship) (see 3. 4. 6).
- (b) Four copies to the Bureau of Ships.
- (c) Two copies to the cognizant Supervisor of Shipbuilding.
- (d) One copy to the cognizant Inspector of Naval Material.
- (e) One copy to the Director, Naval Engineering Experiment Station, Annapolis, Maryland (propulsion machinery and major auxiliary equipment only).
- (f) One copy to the Superintendent, U.S. Naval Academy, Postgraduate School, Monterey, California, (propulsion units and major auxiliary equipment only).
- (g) Two copies to each U.S. Naval Shipyard (except Portsmouth, N.H. - for Military equipment only).
- (h) Two copies to each U.S. Naval Shipyard concerned (for non-Military equipment only).
- (i) Two copies to Portsmouth Naval Shipyard (Submarine equipment only).
- (j) One copy to the Submarine Supply Office, Philadelphia, Pa. (Submarine equipment only).
- (k) Two copies to all Submarine Tenders (Submarine equipment only).
- (l) Six copies to the Commander, Submarine Base, New London, Conn. (Submarine equipment only).
- (m) Manuals for stock shall be specified generally in the following quantities:

| <u>Number of equipments</u> | <u>Number of copies</u> |
|-----------------------------|--------------------------|
| 1 to 25 | 10 plus 2 per equipment |
| 26 to 950 | 50 plus 2 per equipment |
| Over 950 | 100 plus 2 per equipment |

Bulk copies of manuals furnished for stock shall be shipped to:

Commanding Officer
Naval Supply Depot
Mechanicsburg, Pennsylvania
"For SPCC stock"

- (n) In addition to (a) through (m) above, the shipbuilder shall provide technical manuals for selected components and systems in the following minimum quantities to the Fitting Out Activity for placement onboard the ship:

| | <u>Heavy cruisers and larger type ships</u> | <u>Smaller ships</u> | <u>Small craft and submarines</u> |
|----------------------------|---|----------------------|---------------------------------------|
| Engineering piping systems | 50 | 25 | 5 |
| Propulsion prime movers | 10 | 5 | 1 |
| Propulsion reduction gears | 10 | 5 | 1 |
| Boilers, main | 10 | 5 | 1 |

MIL-T-15071B(SHIPS)

| | Heavy cruisers and larger type ships | Smaller ships | Small craft and submarines |
|--|---|---------------|-------------------------------|
| Diesel generator sets | 10 | 5 | 1 |
| Distilling plants | 10 | 5 | 1 |
| Refrigeration plants | 10 | 5 | 1 |
| Gasoline handling systems | 10 | 5 | 1 |
| Submarine electrical pro- pulsion equipment | -- | - | 1 |
| Ships service switchboards and motor generator sets | -- | - | 1 |
| Main storage batteries | -- | - | 1 |

3.2.1 For ships constructed under the Mutual Defense Assistance Program only, the requirements of 3.2 (a) through (m) do not apply. Manuals for equipment and systems peculiar to ships constructed under the Mutual Defense Assistance Program shall be distributed as follows:

- (a) Six copies to the Military Assistance Advisory Group of each foreign Government assigned a ship of the class.
- (b) One copy to the Washington, D. C. Naval Attache of the recipient Government.
- (c) Four copies to the Bureau of Ships.
- (d) One copy to the cognizant Supervisor of Shipbuilding.
- (e) Two copies with each unit of equipment for placement onboard ship (see 3.4.6).
- (f) One copy to the cognizant Inspector of Naval Material.
- (g) Twelve copies to the Naval Supply Depot, Mechanicsburg, Pennsylvania.

Note. - Military equipment is defined as the auxiliary machinery necessary for the operation, maneuverability and combatant efficiency of the vessel.
Nonmilitary equipment is defined as ranges, coffee making apparatus, food mixing machines, sterilizers, laundry machines, sewing machines, refrigerators.

3.3 Type A manuals. - Type A manuals shall be as specified in the individual contract or order.

3.4 General requirements for types B, C, and D manuals. -

3.4.1 Identification. - All manuals shall be identified by a Navy identification number of the form "NAVSHIPS 000-0000" (see figures 1 and 2). This number will be assigned by the bureau or agency concerned upon a receipt of a preliminary copy submitted for bureau or agency approval. In urgent cases, this number may be obtained by a written request, containing complete descriptive data of the equipment. This number shall be imprinted on the upper left-hand corner of the cover, and the upper right-hand corner of the fly-leaf of all manuals prior to distribution.

3.4.2 Reproduction copy. - If offset negatives are used in the publication of the technical manuals, a complete set of such negatives shall, after completion of the manuals, be delivered to the Naval Supply Depot, Mechanicsburg, Pennsylvania and shall remain the property of the Government for use in subsequent reproduction of the manuals. Regardless of the method of printing used, one glossy print or negative of each half-tone illustration included in the manuals, shall be delivered to the Naval Supply Depot, Mechanicsburg, Pennsylvania, and shall remain the property of the Government for use in subsequent reproduction of the manuals. This requirement does not apply to type D manuals (3.7) nor to manuals for which reproduction copy has been previously furnished.

3.4.3 Copyright. - Technical manuals shall not be copyrighted. The bureau or agency concerned reserves the right to reproduce or have reproduced in part or in entirety all manuals procured under this specification.

MIL-T-15071B(SHIPS)

3.4.4 Security classification. - Unless otherwise specified in the contract or order, manuals shall be unclassified. If classified, notification of the classification shall appear on the front and back covers and each page of the manuals as shown on figures 1 to 5, inclusive. In addition, classified manuals shall have the following paragraph printed on the title page as shown on figure 2:

“WARNING: This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C., Sections 793 and 794. The transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.”

Classified manuals shall be marked with consecutive serial numbers beginning with number 1. Receipt cards shall be provided in all classified manuals. Each card shall contain the serial number of the manual in which it is included.

3.4.5 Revision to incorporate changes. - New, revised, or supplementary pages shall be furnished until the guarantee period expires. The quantity of pages furnished and the distribution shall be the same as for the manual provided in the original contract or order.

3.4.5.1 New pages. - When it is found necessary to include new information to augment the manual data, new pages shall be issued. These pages shall be identified with the following legend placed in the bottom outside corner, beside the page number and toward the binding edge of each page; on the first line, the word “New” followed by the NAVSHIPS identification number, and on the second line the month and year of issue. New pages shall bear the same number as the manual page they follow with the addition of a letter; for example, original page 69, new pages 69a and 69b. A reproduction copy of each new page shall be provided.

3.4.5.2 Revised pages. - If it is determined that information originally furnished in manuals must be changed for clarification, correction, or because every equipment covered by the manual has been uniformly modified, revised pages shall be issued. These pages shall be identified with the following legend placed in the bottom outside corner, beside the page number and toward the binding edge of each page; on the first line, the word “Revised” followed by the NAVSHIPS identification number, and on the second line the month and year of issue. Revised pages shall bear the same number as the page they replace. A reproduction copy of each revised page shall be provided.

3.4.5.3 Supplementary pages. - In instances where modifications are made only to a certain number of the total number of equipments covered by the manual, resulting in the need for alternate instructions to cover those items modified, this information shall be issued in the form of supplementary pages. These pages shall be identified with the following legend placed in the bottom outside corner, beside the page number and toward the binding edge of each page; on the first line, the word “Supplementary” followed by the NAVSHIPS identification number on succeeding lines the hull numbers of the specific ships to which the page applies, and on the last line the month and year of issue. Supplementary pages shall bear the same number as the manual page they follow with the addition of a letter; for example, original page 69, supplementary pages 69a, 69b. A reproduction of each supplementary copy shall be provided.

3.4.6 Time of delivery. - Two copies of the manuals shall be delivered with the first unit and each succeeding unit of equipment shipped except that no more than ten manuals for heavy cruisers and larger and no more than six manuals for smaller ships shall be considered necessary to fulfill this requirement when it is known the equipment is destined for a particular ship (see 3.2 for specific exceptions). If final manuals are not available at the time of delivery of the equipment, two copies of an adequate preliminary manual (see 3.4.7) shall be furnished to the Government inspector to fulfill the above requirements for shipment of manuals for each unit.

NOTE: The importance of delivering these manuals with each unit of equipment cannot be too strongly emphasized, since they are of great value in the installation of the equipment and in training and indoctrinating the ship's crew.

MIL-T-15071B(SHIPS)

- (l) Parts identification (see 3.5.1.9).
- (m) Drawings (see 3.5.1.10 and 3.5.2.4.5.4).
- (n) Memorandum pages (see 3.5.1.11).

Note. - Although these requirements are directly applicable to manuals covering specific equipment, they shall be followed as closely as possible for manuals covering systems, such as engineering piping systems. When a manual covers a system or an equipment composed of several distinct units (for example, a generating set consisting of a Diesel engine, a generator, a voltage regulator, and a controller), it may be desirable to arrange the manual in major divisions, each covering one unit. If so, the major divisions may be arranged by sub-divisions, each corresponding to the requirements herein.

3.5.1.1 General data. - This division shall contain data such as the following:

- (a) Safety notice (where high voltages or special hazards are involved) (see figure 9).
- (b) Component list containing:
 - Description of item.
 - Navy type designation.
 - Standard Navy stock number.
 - Dimensions.
 - Weight (with or without packing).
- (c) Input power requirements and heat dissipation.
- (d) Salient design characteristics.
- (e) Electron tube complement.
- (f) Serial number (if appropriate).

3.5.1.2 Introduction. - This division shall include a general description of the equipment; explain briefly what it is, where it is used, and what it will do, also all information of a general character applicable to the complete equipment. When the text contains technical terms or terms not commonly used, definitions shall be included.

3.5.1.3 Detail description. - This division shall contain a complete detailed description of component assemblies and accessories which comprise the complete equipment; for example, in the case of a ship's service turbine generator set, the turbine, the gear, the generator, the exciter, and the voltage regulator. Allowable clearances, temperatures or tolerances shall be shown in tabular form.

3.5.1.4 Installation instructions. - This division shall contain methods of installation, alignment, precautions, mounting instructions, recommendations regarding shielding, grounding or bonding.

3.5.1.5 Adjustment and tests. - This division shall contain instructions for the adjustment and test of the system and its major components upon initial installation or under other conditions such as after major overhaul where complete system readjustment may be required.

3.5.1.6 Principles of operation. - This division shall contain a brief resume of the principles of operation together with such illustrations, sketches, schematic piping diagrams and schematic wiring diagrams to convey an understanding of the function and operation of the equipment. Descriptions of components and assemblies using electron tubes should provide an explanation of the electronic circuits. A preferred method of describing electronic circuits is to present the description in sections, such as amplifier features, power circuits, main audio transmission path and mechanical arrangements. Theory of operation should be included where unusual or unconventional circuits or techniques are involved.

3.5.1.7 Operating instructions. - This division shall contain simple, brief and effective instructions, including normal routines and precautions such as maximum and minimum loads, normal temperature or pressure limits, to be observed in starting, operating and shutting-down the equipment. Where operations are to be performed in specific sequence, step-by-step procedures shall be used. Operations shall be numbered in the order in which they are to be performed. Operating data which is frequently referred to in operating the equipment shall be included in this division. Tables and charts shall be used for the presentation of these instructions where varying operating conditions are encountered.

6

MIL-T-15071B(SHIPS)

3.5.1.8 Maintenance instructions. -

3.5.1.8.1 Preventative maintenance. - This division shall cover all maintenance procedures, inspection and routine adjustments which should be performed periodically and regularly for the purpose of preventing failure or impairment of equipment. Included in this division shall be routine maintenance check charts containing the following:

- (a) A tabulation of periodic routine mechanical and electrical tests and checks which should be accomplished regularly to insure continuity of service at peak performance.
- (b) Arrangement of the table shall be such as to indicate what is to be done, when it is to be done and how to do it.
- (c) Emphasis shall be placed upon the test facilities which may be incorporated in the various components.
- (d) Instructions shall be provided for the care, inspection and cleaning of all pertinent parts.
- (e) Instructions on lubrication shall be provided as applicable, preferably in chart form. They shall include information regarding lubrication recommended by the manufacturer, the type of lubricant to be used, together with specific time periods. Lubricants shall be described by Military specification numbers where applicable and by commercial designations.
- (f) Instructions shall be included stressing the importance of properly maintaining any safety devices, interlocks, provided to prevent damage to equipment or injury to personnel.

3.5.1.8.2 Corrective maintenance. - This division shall cover all information necessary to permit a technician to locate trouble and to make repairs or adjustments to each component, assembly or sub-assembly of the equipment. Included in this division shall be the following:

- (a) Trouble shooting guides for the localization of faults giving possible sources of trouble, the symptoms, probable cause, and instructions for remedying the faults.
- (b) Complete instructions on signal tracing for electric and electronic circuits, use of test instruments and other common servicing techniques.
- (c) Ample illustrations, photographs, exploded views giving details of mechanical assemblies, and simplified schematic diagram of the electric circuits. Illustrations contained in other divisions may be used and referred to under this division without duplicating them.
- (d) Voltage and resistance diagrams or tables for each electronic assembly showing normal voltages (with and without audio signal) and resistances as measured at the terminals of each tube socket and at other significant points in the circuit.

3.5.1.9 Parts identification. - This division shall contain identification data covering all repair parts (parts and assemblies which are wearable or expendable during normal repair) to facilitate ready identification of parts for replacement and ordering purposes. This data shall be presented in one of the three following alternate arrangements:

- (a) Parts list and illustrations. - Where the manual does not include reduced size drawings which are prepared in accordance with the standard drawing format shown on Drawing S0103-73729, listing all repair parts, the parts identification shall be in the form of a parts list with illustrations, arranged as specified in 3.5.1.9.1 and 3.5.1.9.2.
- (b) Drawings and illustrations. - Where the manual includes reduced size drawings which are prepared in accordance with the standard drawing format shown on Drawing S0103-73729 (see figure 5) listing all repair parts, and where only mechanical parts are involved, the parts identification shall be in the form of illustrations to supplement the lists of material on the drawings. Illustrations shall be prepared for each assembly, subassembly and their component repair parts in accordance with 3.5.1.9.2 except that the index numbers shall be identical with the piece numbers assigned on the above drawings. Appropriate notes shall be added to these illustrations referring to the drawings on which the assigned numbers are listed.

7

MIL-T-15071B(SHIPS)

3.6 Type C manuals. -

3.6.1 Contents. - Type C manuals shall contain the following information as applicable, presented in a logical arrangement (see figures 1 to 9, inclusive):

- (a) Title page (see figure 2).
- (b) General data (see 3.6.1.1).
- (c) Table of contents, listing all divisions and primary and secondary subdivisions (such as chapters or sections) with the corresponding page numbers.
- (d) List of illustrations and drawings, specifying titles, figure numbers and pages on which such illustrations appear.
- (e) Detailed description (see 3.6.1.2).
- (f) Installation instructions (see 3.6.1.3).
- (g) Adjustments and tests (see 3.6.1.4).
- (h) Operating instructions (see 3.6.1.5).
- (i) Maintenance (see 3.6.1.6).
- (j) Parts identification (see 3.6.1.7).
- (k) Drawings (see 3.6.1.8).

Note. - Although these requirements are directly applicable to manuals covering specific equipment, they shall be followed as closely as possible for manuals covering systems, such as engineering piping systems. When a manual covers a system or an equipment composed of several distinct units (for example, a generating set consisting of a Diesel engine, a generator, a voltage regulator, and a controller), it may be desirable to arrange the manual in major divisions, each covering one unit. If so, the major divisions may be arranged by subdivisions, each corresponding to the requirements herein.

3.6.1.1 General data. - This division shall contain data such as the following:

- (a) Safety notice (where high voltages or special hazards are involved) (see figure 9).
- (b) Component list containing:
 - Description of item.
 - Navy type designation.
 - Standard Navy stock number.
 - Dimensions.
 - Weight (with or without packing).
- (c) Input power requirements and heat dissipation.
- (d) Salient design characteristics.
- (e) Electron tube complement.
- (f) Serial number (if appropriate).

3.6.1.2 Detailed description. - This division shall contain a complete detailed description of component assemblies and accessories which comprise the complete equipment; for example, in the case of a ship's service turbine generator set, the turbine, the gear, the generator, the exciter, and the voltage regulator. Allowable clearances, temperatures or tolerances, shall be shown in tabular form.

3.6.1.3 Installation instructions. - This division shall contain methods of installation, alignment, precautions, mounting instructions, recommendations, regarding shielding, grounding or bonding.

3.6.1.4 Adjustment and tests. - This division shall contain instructions for the adjustment and test of the system and its major components upon initial installation or under other conditions such as after major overhaul where complete system readjustment may be required.

3.6.1.5 Operating instructions. - This division shall contain simple, brief and effective instructions, including normal routines and precautions to be observed in starting, operating, and shutting-down the equipment. Where operations are to be performed in specified sequence, step-by-step procedure shall be used. Operations shall be numbered in the order in which they are to be performed. Operating data which is frequently referred to in operating the equipment shall be included in this division. Tables and charts shall be used for the presentation of these instructions where varying operating conditions are encountered.

13